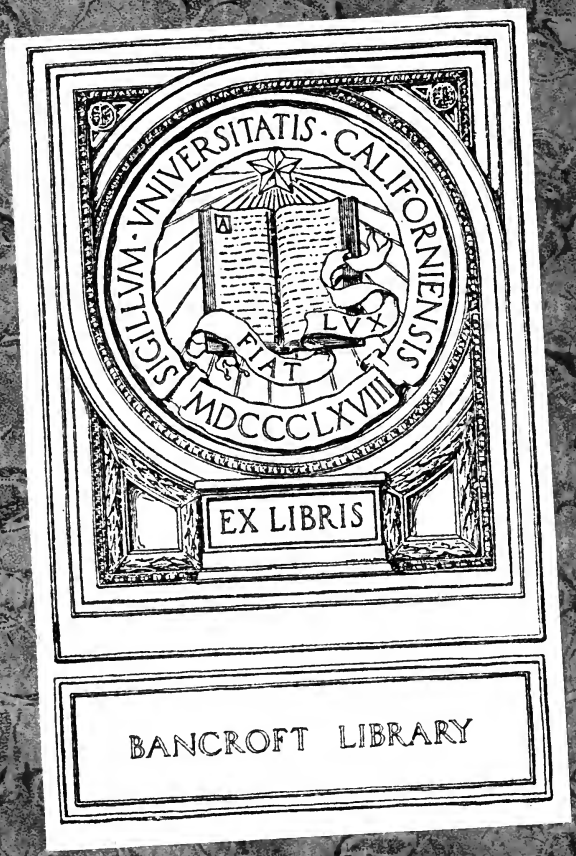

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THE MOST WIDELY USED STAPLE IN THE WORLD

(Reprint of an article from the Monthly Bulletin of the International Bureau of American Republics, April, 1909)

WASHINGTON, D. C.
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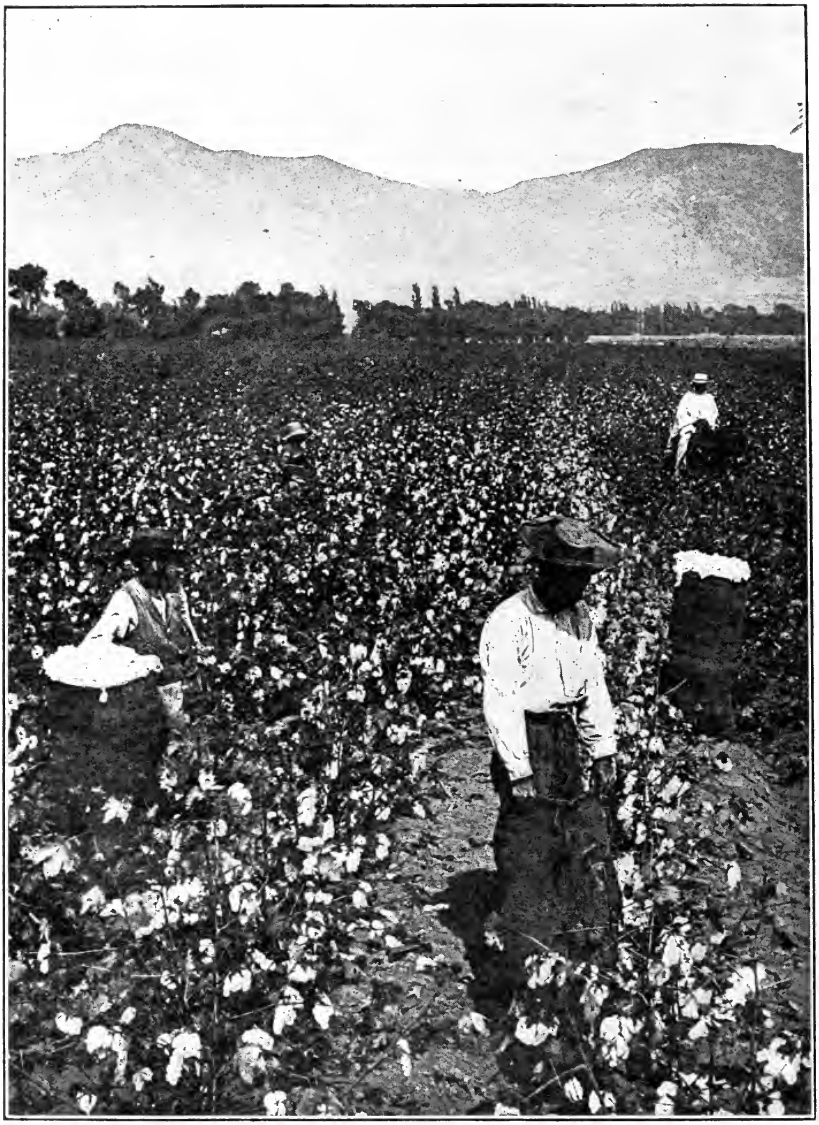
COTTON, THE MOST WIDELY USED STAPLE IN THE WORLD

WHEN and where cotton was first utilized in the industrial and commercial activities of the world can not be definitely established. It does not appear to have been cultivated or woven into fabrics in ancient Egypt, and expert chemical analysis of the cloths used for wrapping Egyptian mummies proves that these materials were of linen and not cotton. The records of India, on the other hand, demonstrate that from time immemorial the cotton plant was cultivated and its fiber converted into wearing apparel, and employed in the useful and ornamental arts. Cotton has also been known and used for a thousand years, at least, in China and Japan. In the rich literature of India this beneficent plant is hardly more than incidentally mentioned. Its textile value and uses were known to the Hebrews and Phœnicians, and probably, through the latter, to the Greeks and Romans.

The Arabs and Saracens introduced cotton into western Europe in the ninth century, but it was not until the fifteenth century, when merchants of Genoa brought cotton to England, in exchange for woolen goods, that its possible commercial and industrial importance was realized. Although Columbus gives no description whatever of the cotton plant, later Spanish and Portuguese explorers found cotton garments worn and cotton extensively cultivated by the Indians on the islands of the West Indies and in Mexico, Peru, and Brazil. Cortez speaks highly of the skill of the Mexican natives in cotton weaving and spinning. Pizarro found cotton fabrics in ancient Peruvian tombs which some modern archæologists trace back to a civilization antedating that of the Incas.



CHINESE PICKING COTTON ON IRRIGATED LAND IN PERU.

Peru is famed for the excellent quality and fiber of its cotton, for the improved production of which extensive irrigation works are being constructed in the Departments of Piura and Lima, on the coast. Chinese labor is largely employed, being cheap and efficient. The total exports of Peruvian cotton in 1907 were valued at nearly $3,000,000.

Early Portuguese historians describe cotton as they found it in Brazil.

Gossypium, the scientific and botanical name for the cotton family and genus, has been traced back to the Sanskrit and to the Latin *Cossipium* (the fleece worn). The word cotton is derived from the Arabic *qutun*, which originally denoted flax.

The cotton plant is a member of the *Malvaceæ* or mallow family, and the total number of species actually existing is very large. In its wild state it is apt to be a perennial, but when cultivated it frequently becomes an annual. In size the plant varies from less than a foot high to 16 or more feet. The flowers are either single or

AN EGYPTIAN COTTON FIELD.

Egypt stands third among the cotton-producing countries of the world, being ranked only by the United States and British India. Several varieties are grown, but all of them resemble in many respects the well-known American sea-island species. Although the United States is by far the greatest cotton-producing country in the world, it imports large quantities of Egyptian cotton, averaging nearly 54,000,000 pounds annually during the past ten years.

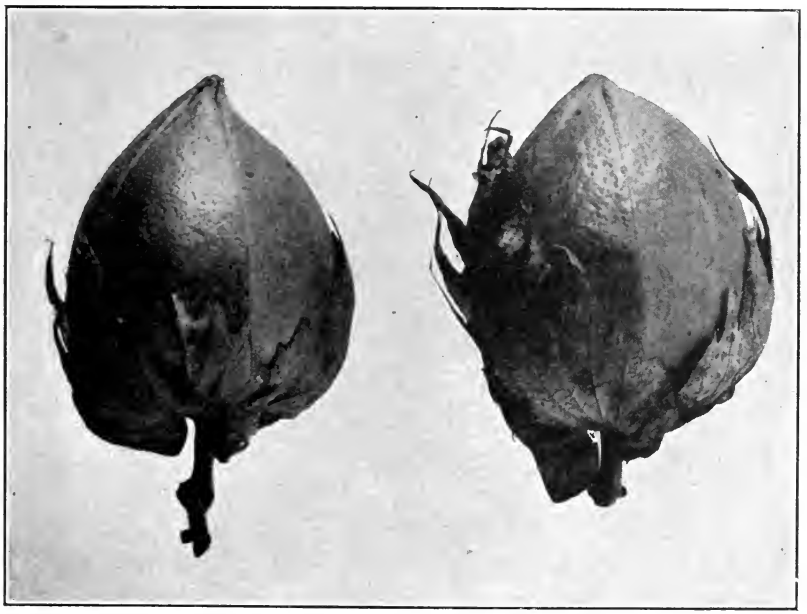
in clusters, varying greatly in size, while the color ranges from a yellowish white to a pale yellow and a rusty red. There are infinite variations in the form and size of the leaves, some being smooth and glossy and others hairy, but they are always lobed, having three, five, or seven lobes. What is known as the "boll" is, for manufacturing purposes, the most important part of the plant, as it contains not only the seeds but also the floss. The pure white varieties of floss, obtained by careful cultivation and selection, are preferred, but among the brown and rust-colored varieties there are some of high industrial value. The cotton bud develops in the following manner: First, the

TRIUMPH COTTON FROM YAZOO CITY, MISSISSIPPI.

This variety was originated in Lockhart, Texas, and was developed from a single plant found in the general crop in 1899 by a planter of that region. It is known as the storm-proof variety, is nondropping, and produces a high percentage of lint.

flower; then the matured "boll" or pod; next, the hard outer covering opens, revealing the white wool-like material within, and, finally, when the white material containing the seeds is removed there remain the four husks of the boll.

Cotton is primarily a native of the tropics, and the number of species diminish rapidly in direct ratio to their distance from the equator. The cotton plant, whether wild or cultivated, is found in a belt of land encircling the globe between 45° north latitude and 30° south latitude, though only where local climatic conditions are favorable can cotton be raised as far north as 45°, as for example in Asiatic Russia, which has the same latitude as Massachusetts.



BOLLS OF TRIUMPH COTTON.

The chief cotton-producing areas of the world embrace: In the United States, the Southern States, including all those parallel with or south of North Carolina, as far west as New Mexico; practically all of British India; and Egypt, which ranks third as a cotton-producing country, followed by Asiatic Russia, Central China and Japan, Brazil, Mexico, and Peru. Among other countries where considerable quantities of cotton are grown, or can be grown, are Paraguay, Colombia, Venezuela, and Central America. The Latin-American field has remarkable possibilities.

In the seventeenth century the first attempt to grow cotton was made in Virginia, and by 1653 the staple had already become of much national importance in the British colonies of North America.

Cotton in England became a competitor to the then strongly intrenched woolen industry, and its manufacture being made profitable through the great inventions of Arkwright and others, it received governmental protection and encouragement. Arkwright's and other English patents were introduced into America, and at the close of the eighteenth century Whitney's saw gin was invented.

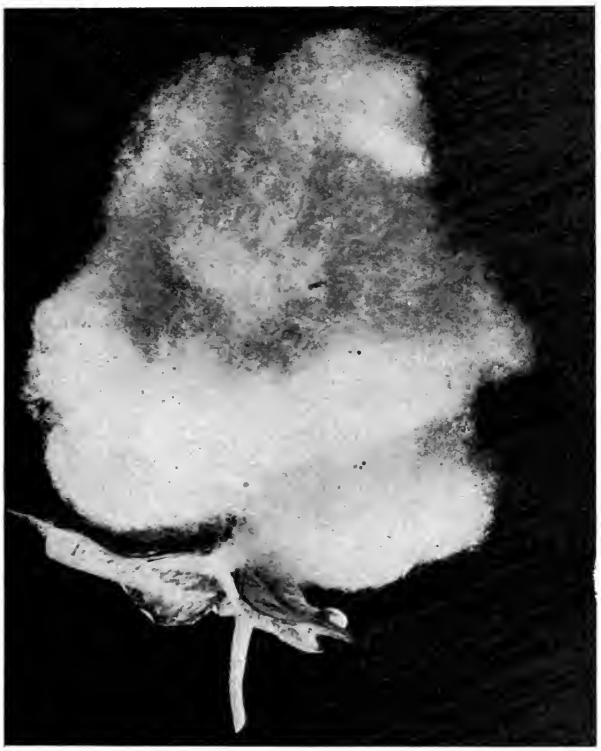
Up to this time England had obtained her supplies of cotton chiefly from the Levant, the West Indies, and South America, but at the opening of the nineteenth century, out of her total consumption of 54,000,000 pounds of raw cotton, India furnished 6,500,000 pounds and the United States 20,000,000 pounds. By the middle of the century Fall River, Massachusetts, in the United States, and Manchester and Lancashire, in England, had become the great cotton manufacturing centers of the world. India was also coming to the front as a producer of cotton.

The cotton industry in the United States was terribly paralyzed by the American civil war, and it cost the Southern States thirteen years to regain their former supremacy. At present the most remarkable fact in regard to the United States is that the Southern cotton-growing States are becoming rivals of the Northern noncotton-growing States, and particularly New England, in the manufacturing of cotton textiles. India has advanced to such an extent as a cotton-manufacturing country that, as in the United States, the demands of her own mills naturally control the amount of raw cotton available for export. The twentieth century is characterized by the rapidly advancing progress of cotton manufacturing in the United States, on the Continent of Europe, and in India, which countries are seriously menacing the supremacy of Great Britain in the cotton markets of the world.

The beneficence of the cotton plant as an agent of civilization can hardly be overestimated. Its sudden development is almost unparalleled in the history of economic products, and its enormous importance to-day in the agricultural, commercial, and industrial life of the world renders it difficult to believe that scarcely more than two hundred years ago cotton was practically unknown to the civilized nations of the West. The superiority of raw cotton for the purposes of textile manufacture consists in the fact that the fiber of its floss has a natural twist, possessed by no other vegetable fibers, which renders it peculiarly adaptable for spinning and weaving. Out of its natural wool light and durable clothing is made, and it is manufactured into other textile articles numerous beyond description. Textiles manufactured from a mixture of cotton and wool materially lessen the heat-retaining properties of wool and furnish garments of a medium warmth, while cotton and silk, or cotton and linen, when

interwoven, produce useful and pleasing articles of apparel and ornament. Cotton and cotton wool, in medicine, surgery, and dentistry, have an ever-increasing number of applications. Finally, goods manufactured out of cotton are relatively cheap.

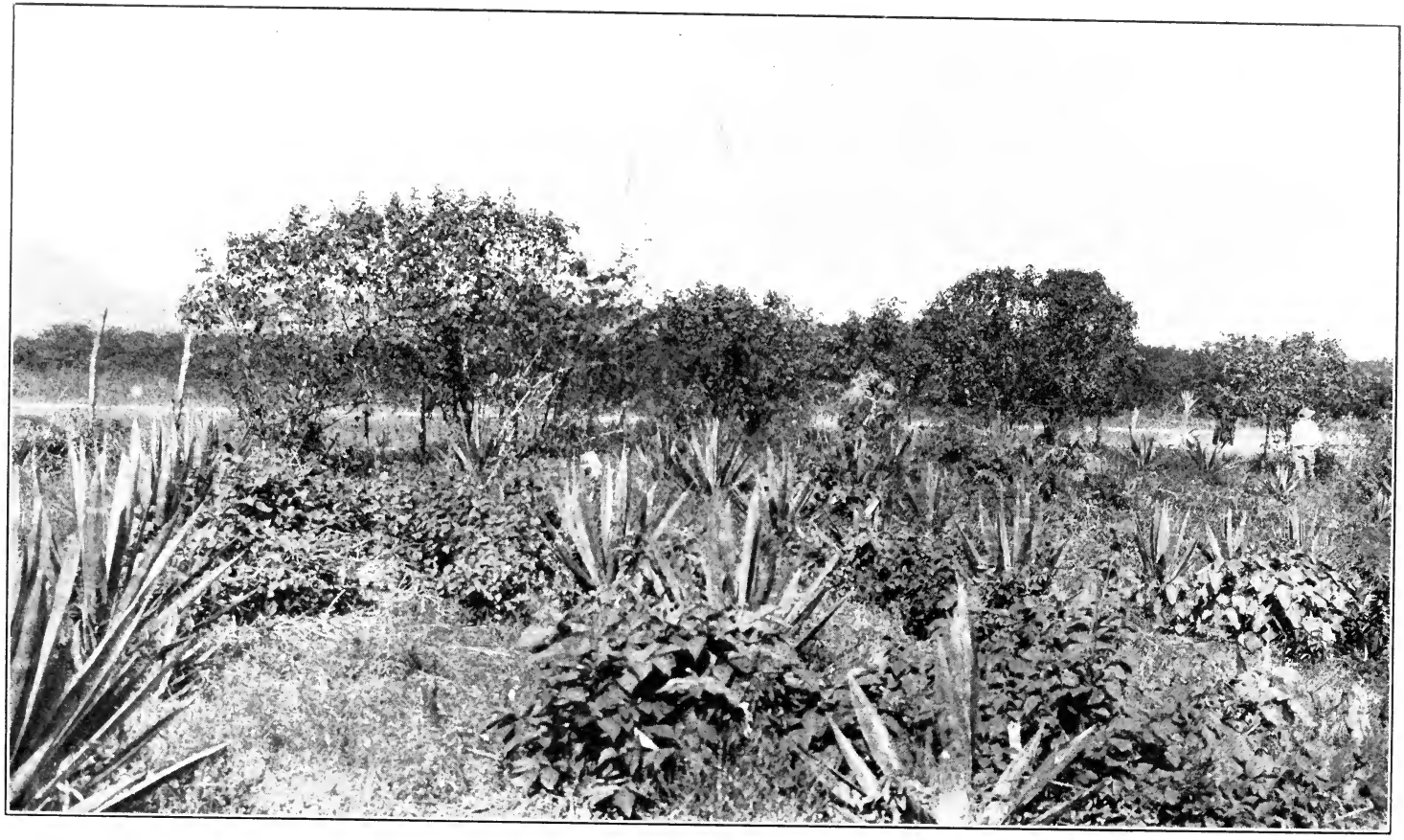
The usefulness of cotton does not end with its adaptability for spinning and textile manufacture. Its seeds furnish an oil which is edible and of industrial value. The stems and leaves furnish an



AN OPEN BOLL OF EGYPTIAN COTTON.

The several species of Egyptian cotton are characterized by long and very strong fibers, smooth seeds, small, pointed, three-locked bolls, and yellow flowers. Some of them are second only to sea-island cotton in the length, fineness, and silkiness of their fiber. The great strength and high degree of twist allow the production of a very strong yarn in manufacture, and they bring a price second only to that paid for the highest grades of sea-island, being used solely in the manufacture of the finest goods.

admirable fodder for live stock. Indeed, there is no portion of the plant that has not a high value. Human ingenuity has constantly discovered new applications of its products, notably, the manufacture of gun cotton, a highly explosive substance, obtained by soaking cotton in nitric and sulphuric acids, and then leaving it to dry. This substance, when dissolved in a mixture of rectified ether and alcohol, yields an adhesive liquid called collodion, much used in surgery.

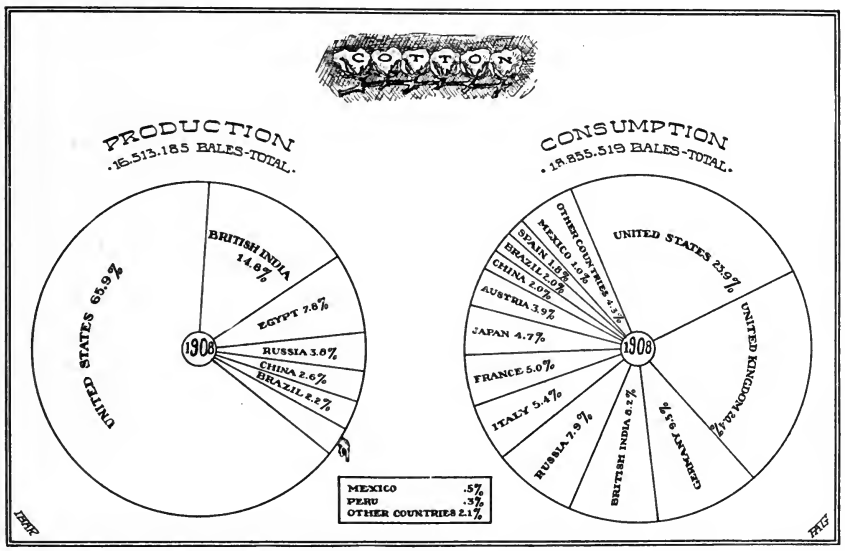


A MEXICAN COTTON TREE.

The frequent references to the value of the cotton tree has caused a great deal of interest in its possibilities by cotton planters everywhere. The floss obtained from the tree resembles in appearance the cotton of commerce, but the staple is short and lacks the strength and fineness of the Sea Island and Upland cottons. United States capital was recently reported as being interested in the Mexican *caravonica*, or tree cotton, and two companies were organized with a joint capital stock amounting to $1,000,000 to develop the industry.

As cotton is grown in so many independent centers within the geographical belt between 45° north and 30° south latitude, and many countries make no record of the production within their own areas, it is impossible to state with exactness the total amount annually produced and consumed in the world, but the accompanying table gives an idea of the relative consumption in the leading countries engaged in the industry.

The cotton plant is peculiarly susceptible to a variety of diseases and pests, one of the most formidable being the boll-weevil worm, which came from Mexico into Texas about 1893. It is difficult to calculate the exact losses entailed by armies of weevils during their incursions, year after year, into the cotton belt of the United States. In Texas alone it was estimated that in 1902 and 1903 over $20,000,000



worth of cotton was destroyed each year by weevils and other insect pests. Through the investigations and efforts of the United States Department of Agriculture and the cooperation of the various state governments of the cotton-growing area, and also of Mexico, the ravages of these pests have been materially reduced. One successful method is to introduce early maturing varieties of cotton, and by other means to hasten the harvesting of crops. Another is to endeavor to discover what species, whether wild or cultivated, have the greatest power of resistance. An eminent naturalist, Mr. O. F. Cook, has discovered that, probably for untold centuries, the Indians of Central Guatemala have cultivated a perennial variety of upland cotton called *Kekchi*, in spite of the presence of numerous boll

A COTTON FACTORY IN RIO DE JANEIRO, BRAZIL.

There are about 140 cotton factories in the Republic, with approximately 45,000 looms and an annual output of nearly 200,000 miles of cloth, sufficient to girdle the earth eight times. About one-third of the industrial capital of the country is invested in cotton mills. While importing more than $33,000,000 worth of cotton manufactures yearly, Brazil also exports the equivalent of about 140,000 bales of raw cotton each year, in addition to approximately 34,000 tons of cotton seed.

weevils. The climate during the summer has a prolonged dry season, which is a natural aid against weevils.

Among the most useful varieties of the cotton plant are the *Sea Island* (of long staple); the *Uplands* (long and short staples); the *Egyptian cotton* (long staple); and, what appears to be one of the parent stocks of the Egyptian, the *Peruvian* (*G. Peruvianum*), the fibers or staples of which are exceptionally long.

Every Republic in Latin America grows cotton. In some of them—Peru, for instance—and along various parts of the Caribbean coast, cotton is an indigenous plant, and was used by the natives before the discovery of America; in others it has been introduced because the soil and climate were found to be particularly well adapted to all the needs and requirements of successful cultivation. In all probability the ancient aqueducts of the Incas, by which the whole valley of Chira was at one time irrigated, would not have been built had these aborigines not wished to use the land for cotton growing. A modern example of the same industrial ambition is to be found in the famous Laguna district of Mexico, in which, hardly more than a generation ago, the cotton plant was little known, but the soil and climate of the locality were found to be so remarkably suited to its cultivation that a portion of the immense State of Coahuila was irrigated, with the result that the value of the cotton crop now runs into the millions of dollars annually, and an entirely new area has been peopled. During and shortly after the civil war in the United States a large migration from the South took place to Central America, Colombia, Venezuela, the Guianas, and Brazil, and the colonists were for a time very successful in planting new cotton fields; but on the declaration of peace, many returned to their old homes, and the industrial activity, due to their settlement, has only recently been emulated by native energy. Now, however, with the increase in the demand for cotton, the popularity of its textiles in all directions and the growing need for the utilization of products which all the Republics of Latin America can so abundantly supply, these cotton areas of the New World are attracting decided attention.

Mexico, Brazil, and Peru are the three Republics in which cotton cultivation has the widest extension, and each of these has given its name to a particular indigenous species of the plant. The plants cultivated in the other Republics belong to some one of these species or they have been introduced from abroad as promising better results than the American plant.

In Mexico the native cotton was found along the eastern shore, but every State in the Republic can grow or is actually growing cotton to-day, and the annual yield would be very much greater even than it is if other crops did not prove at present more profitable.

BALES OF TEXAS COTTON.

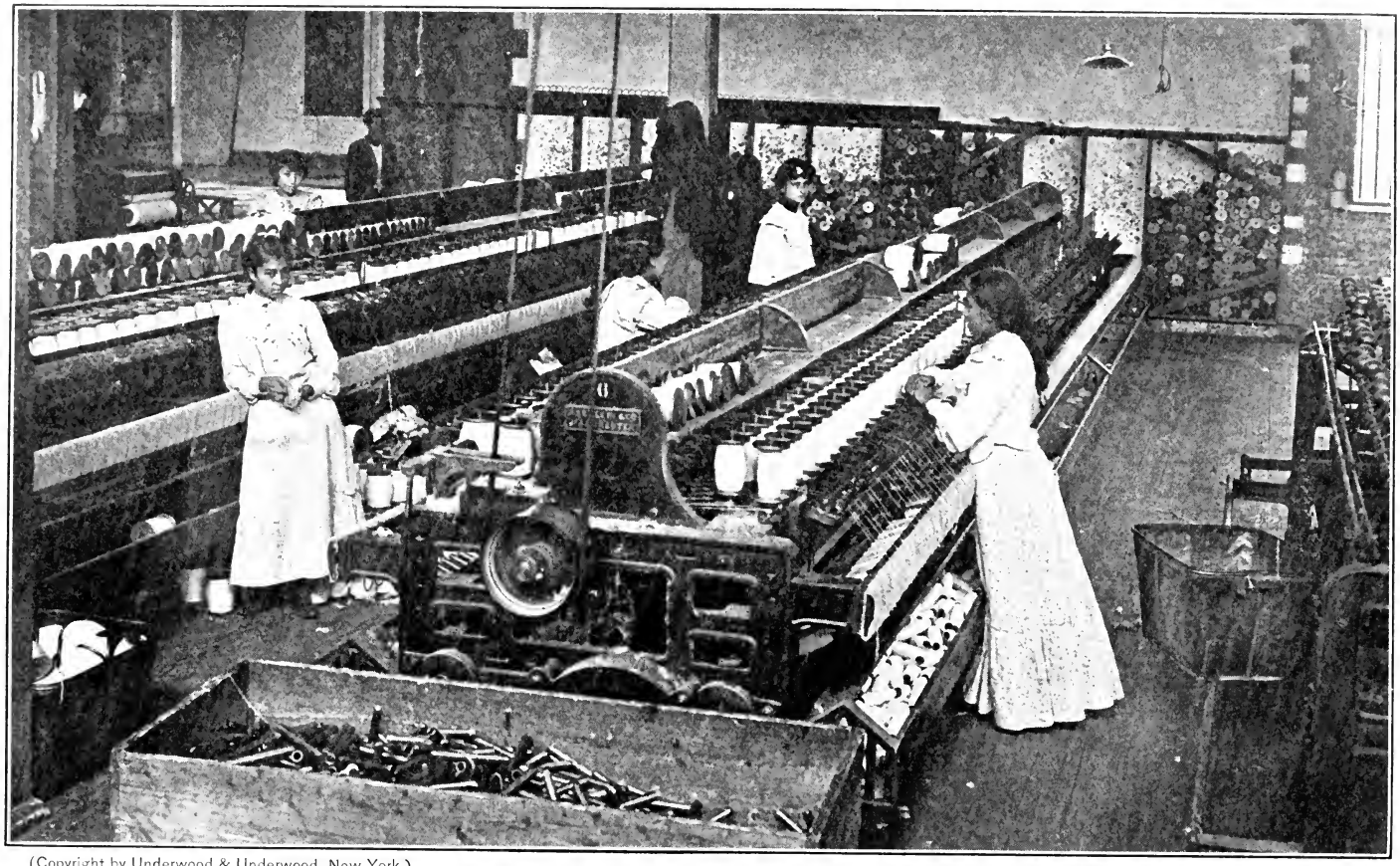
Part of the four-million-bale cotton crop of the great State of Texas ready for shipment to the market. Each bale weighs approximately 500 pounds. The cotton belt of Texas is one of the most productive in the United States, and the State leads in the output of this fleecy staple.

The same assertion may be made in regard to Brazil. Every State has its cotton fields, but only along the Atlantic seaboard of the mid-tropic State is it cultivated sufficiently to form a staple for export. Almost every State in Brazil also has cotton mills, and these form a very prosperous industry in the country. One-third the entire industrial capital of the country, representing $60,000,000, is invested in cotton mills. They pay substantial profits and could consume all the raw cotton produced, although, owing to the configuration of the country, it is often easier to export raw cotton than to try to use it in home mills.

The average value of Peruvian cotton is about $2,500,000 annually, but the area over which it may be cultivated is by no means exhausted. In all the valleys west of the Andes both climate and soil are remarkably favorable, and it is only a question of time, coupled with sufficient labor, when Peru will rank among the great cotton-producing and probably manufacturing countries of the world.

Paraguay is naturally a great cotton country with as high a production per acre, where cultivation is systematically carried out, as that of older and better-known lands. The plant grows spontaneously here, and the raw cotton is finding profitable export to the Argentine Republic and Brazil. The Government is taking wise steps to encourage the industry by offering suitable encouragement to immigrants who will settle on cotton lands and by arranging for a suitable plan whereby the raw cotton may find a foreign market. It is predicted that within a few years Paraguay will be able to export cotton to the amount of $100,000,000 annually.

Although the cotton crops of the other Republics have not yet assumed such proportions that they can be reckoned by percentages among the total output of the world, yet in the aggregate they amount to a noticeable figure. All Central America grows cotton; Panama has valleys that can be brought under cultivation whenever the demand arises; the West Indian Islands all have profitable cotton areas; every country north of the Tropic of Capricorn is blessed with large tracts, either near the sea or in the sheltered valleys of the fertile uplands, where cotton is cultivated for local use or with greater scientific regard than characterized its growth a generation ago. Even Chile and the Argentine Republic, within the Temperate Zone, are giving careful attention to cotton as a profitable agricultural product for the future, and both Republics are exporting cotton as well as manufacturing it. It will be seen, therefore, that when the cotton-bearing areas of the rest of the world, such as are used to-day or are known to be susceptible of cultivation, are in full yield, the soil and climate of Latin America will be found peculiarly adapted by nature, and still more enhanced by the art of man, for the profitable production of cotton.



WINDING MACHINE, INCA COTTON MILLS, LIMA, PERU.

There are fine, well-equipped cotton factories located at Lima, one at Arequipa, and one at Ica, the raw material consumed amounting to about 3,000 tons per annum. The Government encourages the industry by the free distribution of cotton seed to planters.

A striking feature of the cotton industry deserves attention. As has been noticed, all Latin America is peculiarly adapted to the cotton plant, and in many instances areas for its cultivation have been for centuries utilized. Before the time of modern commerce the manufacture of the raw material into the finished product was necessarily a matter of domestic activity, but as the mechanical arts progressed in the United States and Europe raw cotton was exported, manufactured abroad into cloth, and as such imported by the country growing it. The United States even to-day continues this practice, as great quantities of raw cotton are exported to the spindles of Europe to be returned transformed into delicate fabrics. The same process is going on in Latin America. The factories of these countries can not keep pace with the demand for cloth, especially that of the finer grades, resulting from the increased standard of living. It happens, therefore, that cotton countries still import cotton goods, and will continue to do so. Brazil uses $33,000,000 of foreign-made cotton cloth; Argentina, $30,000,000; Chile, $13,000,000; Cuba, $8,000,000; Mexico, $7,000,000; Peru, $3,000,000 annually. Only a small fraction of this is in competition with the product of the domestic spindles; the larger portion is used to meet the increasing demand, or is the highest grade class of fabric, which must bear a foreign stamp. Therefore this market is open to the world. By degrees all America will develop its cotton manufacturing industry; the production of native cotton will more and more be utilized in the local mill, but until that period arrives the increasing population of every country will have to be supplied with the finished cloth from cotton.